

Application No.: 10/068,276

Docket No.: JCLA8191

**In the Claims:**

Please amend the claims 1 and 29 and add claims 40-53 according to the following listing of claims and substitute it for all prior versions and listings of claims in the application.

Claim 1 (currently amended). A tape ball grid array package, comprising:

a tape having:

a dielectric layer having a first side, a second side and a plurality of via holes that pass through the dielectric layer;

a patterned first metallic layer over the first side of the dielectric layer such that one end of the via holes is closed to form a plurality of blind holes;

a patterned second metallic layer over the second side of the dielectric layer exposing the open end of the blind holes;

a patterned first solder mask layer over the first metallic layer exposing a portion of the first metallic layer to serve as a plurality of contact points;

a patterned second solder mask layer over the second metallic layer exposing a portion of the second metallic layer and the open end of the blind holes;

a plurality of solder balls inserted into the blind holes with one end of the solder balls protruding out from the surface of the second solder mask layer, wherein the solder balls and the first metallic layer are electrically connected while at least one solder ball and the second metallic layer are electrically connected such that portions of the second metallic layer are circularly embedded in the solder ball; and

Application No.: 10/068,276

Docket No.: JCLA8191

at least one chip over the first side of the tape, wherein the chip connects electrically with various contact points on the tape.

Claim 2 (original). The package of claim 1, wherein material constituting the dielectric layer includes polyimide.

Claim 3 (original). The package of claim 1, wherein the second metallic layer serves as a power source layer or a ground layer.

Claim 4 (original). The package of claim 1, wherein the first metallic layer serves as a signal transmission layer.

Claim 5 (original). The package of claim 1, wherein material constituting the first metallic layer and the second metallic layer includes copper.

Claim 6 (original). The package of claim 1, wherein the upper surface and the lower surface of the first metallic layer as well as the upper surface of the second metallic layer further include metallic alloy layers.

Claim 7 (original). The package of claim 6, wherein material constituting the metallic alloy layer includes nickel-gold or lead-tin alloy.

Claim 8 (original). The package of claim 1, wherein the chip has an active surface and a back surface, and the active surface of the chip further includes a plurality of bonding pads.

Claim 9 (original). The package of claim 8, wherein the package further includes a plurality of conductive wires and packaging material, wherein the backside of the chip is attached to the first solder mask layer, the conductive wires connect the bonding pads with corresponding

Application No.: 10/068,276

Docket No.: JCLA8191

contact points on the tape, and the packaging material encloses the chip, the conductive wires and the contact points.

Claim 10 (original). The package of claim 9, wherein the package further includes a stiffener on the first solder mask layer surrounding the packaging material.

Claim 11 (original). The package of claim 8, wherein the chip further includes a plurality of bumps protruding from the bonding pads, and the bumps correspond in position to various contact points.

Claim 12 (original). The package of claim 11, wherein the package further includes underfilling material that encloses the bonding pads, the bumps and the contact points.

Claim 13 (original). The package of claim 11, wherein the package further includes a stiffener on the first solder mask layer and surrounds the chip.

**Claims 14-28 (cancelled).**

Claim 29. (currently amended). A tape ball grid array package, comprising:

a tape having:

a dielectric layer having a first side, a second side and a plurality of via holes that pass through the dielectric layer;

a patterned first metallic layer over the first side of the dielectric layer such that one end of the via holes is closed to form a plurality of blind holes, wherein the first metallic layer serves as a signal transmission layer;

Application No.: 10/068,276

Docket No.: JCLA8191

a patterned second metallic layer over the second side of the dielectric layer exposing the open end of the blind holes, wherein the second metallic layer serves as a power source layer or a ground layer;

a patterned first solder mask layer over the first metallic layer exposing a portion of the first metallic layer to serve as a plurality of contact points;

a patterned second solder mask layer over the second metallic layer exposing a portion of the second metallic layer and the open end of the blind holes;

a plurality of first solder balls inserted into a portion of the blind holes with one end of the first solder balls protruding out from the surface of the second solder mask layer, wherein the first solder balls are electrically connected with the first metallic layer;

a plurality of second solder balls inserted into a portion of the blind holes with one end of the second solder balls protruding out from the surface of the second solder mask layer, wherein the second solder balls are electrically connected with both the first metallic layer and the second metallic layer, and portions of the second metallic layer are circularly embedded in the second solder balls; and

at least one chip over the first side of the tape, wherein the chip connects electrically with various contact points on the tape.

Claim 30 (previously added). The package of claim 29, wherein material constituting the dielectric layer includes polyimide.

Claim 31 (previously added). The package of claim 29, wherein material constituting the first metallic layer and the second metallic layer includes copper.

**Application No.: 10/068,276**

**Docket No.: JCLA8191**

Claim 32 (previously added). The package of claim 29, wherein the upper surface and the lower surface of the first metallic layer as well as the upper surface of the second metallic layer further include metallic alloy layers.

Claim 33 (previously added). The package of claim 32, wherein material constituting the metallic alloy layer includes nickel-gold or lead-tin alloy.

Claim 34 (previously added). The package of claim 29, wherein the chip has an active surface and a back surface, and the active surface of the chip further includes a plurality of bonding pads.

Claim 35 (previously added). The package of claim 34, wherein the package further includes a plurality of conductive wires and packaging material, wherein the backside of the chip is attached to the first solder mask layer, the conductive wires connect the bonding pads with corresponding contact points on the tape, and the packaging material encloses the chip, the conductive wires and the contact points.

Claim 36 (previously added). The package of claim 35, wherein the package further includes a stiffener on the first solder mask layer surrounding the packaging material.

Claim 37 (previously added). The package of claim 34, wherein the chip further includes a plurality of bumps protruding from the bonding pads, and the bumps correspond in position to various contact points.

Claim 38 (previously added). The package of claim 37, wherein the package further includes underfilling material that encloses the bonding pads, the bumps and the contact points.

Application No.: 10/068,276

Docket No.: JCLA8191

Claim 39 (previously added). The package of claim 37, wherein the package further includes a stiffener on the first solder mask layer and surrounds the chip.

Claim 40 (new). A tape for forming a tape ball grid array package, comprising:

a dielectric layer having a first side, a second side and a plurality of via holes that pass through the dielectric layer;

a patterned first metallic layer over the first side of the dielectric layer such that one end of the via holes is closed to form a plurality of blind holes;

a patterned second metallic layer over the second side of the dielectric layer exposing the open end of the blind holes; and

a plurality of solder balls inserted into the blind holes respectively with one end of the solder balls protruding out from the surface of the second metallic layer, wherein the solder balls and the first metallic layer are electrically connected, while at least one solder ball and the second metallic layer are electrically connected such that portions of the second metallic layer are circularly embedded in the solder ball.

Claim 41 (new). The tape of claim 40, further comprising:

a patterned first solder mask layer over the first metallic layer exposing a portion of the first metallic layer to serve as a plurality of contact points; and

a patterned second solder mask layer over the second metallic layer exposing a portion of the second metallic layer and the open end of the blind holes.

**Application No.: 10/068,276**

**Docket No.: JCLA8191**

Claim 42 (new). The tape of claim 40, wherein material constituting the dielectric layer includes polyimide.

Claim 43 (new). The tape of claim 40, wherein the first metallic layer serves as a signal transmission layer.

Claim 44 (new). The tape of claim 40, wherein the second metallic layer serves as a power source layer or a ground layer.

Claim 45 (new). The tape of claim 40, wherein material constituting the first metallic layer and the second metallic layer includes copper.

Claim 46 (new). The tape of claim 40, wherein the upper surface and the lower surface of the first metallic layer as well as the upper surface of the second metallic layer further include metallic alloy layers.

Claim 47 (new). The tape of claim 46, wherein material constituting the metallic alloy layer includes nickel-gold or lead-tin alloy.

Claim 48. (new). A tape for forming a tape ball grid array package, comprising:

a dielectric layer having a first side, a second side and a plurality of via holes that pass through the dielectric layer;

a patterned first metallic layer over the first side of the dielectric layer such that one end of the via holes is closed to form a plurality of blind holes, wherein the first metallic layer serves as a signal transmission layer;

Application No.: 10/068,276

Docket No.: JCLA8191

a patterned second metallic layer over the second side of the dielectric layer exposing the open end of the blind holes, wherein the second metallic layer serves as a power source layer or a ground layer;

a plurality of signal solder balls inserted into a portion of the blind holes respectively with one end of the signal solder balls protruding out from the surface of the second metallic layer, wherein the signal solder balls are electrically connected with the first metallic layer; and

a plurality of power solder balls or ground solder balls inserted into a portion of the blind holes respectively with one end of the power or ground solder balls protruding out from the surface of the second metallic layer, wherein the power or ground solder balls are electrically connected with both the first metallic layer and the second metallic layer, and portions of the second metallic layer are circularly embedded in the power or ground solder balls.

Claim 49 (new). The tape of claim 48, further comprising:

a patterned first solder mask layer over the first metallic layer exposing a portion of the first metallic layer to serve as a plurality of contact points; and

a patterned second solder mask layer over the second metallic layer exposing a portion of the second metallic layer and the open end of the blind holes.

Claim 50 (new). The tape of claim 48, wherein material constituting the dielectric layer includes polyimide.

Claim 51 (new). The tape of claim 48, wherein material constituting the first metallic layer and the second metallic layer includes copper.



**Application No.: 10/068,276**

**Docket No.: JCLA8191**

Claim 52 (new). The tape of claim 48, wherein the upper surface and the lower surface of the first metallic layer as well as the upper surface of the second metallic layer further include metallic alloy layers.

Claim 53 (new). The tape of claim 52, wherein material constituting the metallic alloy layer includes nickel-gold or lead-tin alloy.